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BIENNIAL REPORT

1969 - 1971

COUNTY OF LOS ANGELES
DEPARTMENT OF ARBORETA
AND BOTANIC GARDENS

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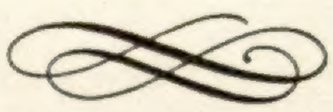
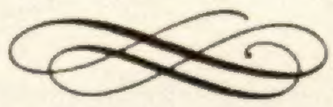
LOS ANGELES STATE & COUNTY

ARBORETUM



DESCANSO GARDENS



SOUTH COAST BOTANIC GARDEN

Compiled, written, and edited by
Donald S. Dimond, Chief
Public Services Division

COUNTY OF LOS ANGELES

ARBORETA AND BOTANIC GARDENS

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FRANCIS CHING
DIRECTOR

Board of Supervisors
County of Los Angeles
Hall of Administration
500 West Temple Street
Los Angeles, California 90012

Gentlemen:

The 1969-71 biennium at this Department was marked by administrative and organizational changes brought about by the appointment of a new Director by your Board on May 5, 1970.

The period was also marked by an increased response to environmental problems at research, educational and public service levels as reflected in additional research projects on air pollution, plant diseases, and problems dealing with forest fires. The results of this work have been transmitted to the general public in the form of brochures. Other public services reflecting the Department's increased response to community needs were a new Sunday Afternoon Lecture series, ecology walks, and an improved and expanded school field trip program serving some 43,000 school children each year.

A major development at the Arboretum - the Aquatic Gardens - was made possible through private funds, as was an Oriental Garden at Descanso Gardens. Through joint funding, public and private, a new demonstration garden at the Arboretum with home gardening features was completed, and the historic Santa Anita Train Depot was moved to the grounds of the Arboretum. The Research Laboratory at the Arboretum and the construction of the lake and stream at South Coast Botanic Garden were completed with public funds.

The many accomplishments of the Department these past two years were made possible through the efforts of a dedicated staff and the Board of Governors and through the efforts of interested citizen supporting foundations: the California Arboretum Foundation, Inc., the Descanso Gardens Guild, Inc., and the South Coast Botanic Garden Foundation, Inc. To them I wish to extend my sincere appreciation for their fine work and the cooperative spirit in which it was done.

Respectfully submitted,

Francis Ching
Director

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THE LOS ANGELES STATE AND COUNTY ARBORETUM, *Arcadia*

ATTENDANCE

A comparison of figures of the past three biennial periods suggest a stabilization in Arboretum attendance within a 3-4% margin. However, the expansion of the garden's public services and attractions can be expected to raise future attendance to a higher level.

1967 - 68	1968 - 69	1969 - 70	1970 - 71
543,124	538,586	572,220	553,829
1,081,710		1,126,049	

DEMONSTRATION HOME GARDENS

The Demonstration Home Gardens received more attention in this biennium than at any time since they were opened in 1958 as a joint project of the California Arboretum Foundation and Sunset Magazine.

The major developments were:

the gardens enlarged by 4,264 square feet;
installation of two 9′ X 12′ climatically-controlled greenhouses;
construction of a 25-foot-long potting area containing soil bins and cabinets for displays and storage;
a saran area for shade plants.

These developments have extended the use of the Demonstration Home Gardens by providing an appropriate area for demonstration-lectures on growing plants and for permanent educational displays of aid to students and the public.

Additionally, fixtures were installed (Jan. '71) for night lighting, and the path leading from the rotunda to the Demonstration Home Gardens was paved and landscaped (Feb. '71). Funds for these developments were provided through Urban Beautification, Los Angeles County; the California Arboretum Foundation, Inc.; and Sunset Magazine.

AQUATIC GARDEN

Perhaps the most spectacular garden development in this two year period was the addition of a terraced aquatic garden on top of Tallac Knoll that empties into the Meyberg Waterfall. Approximately three-quarters of an acre overall, the pools are planted with 525 aquatic plants representing 18 genera and 45 plant species and cultivars. The shoreline is planted with ground covers that blend with tree ferns, low palms, shrubs of different colors, and, finally, the stately oaks in the background.

A circulating pump carries the water to pool inlets at various shoreline locations and is designed to maintain water movement and circulation so as to control the growth of algae. A scenic delight for the casual visitor, the garden represents a rare source of information for fanciers of aquatic plants and a useful area for the study of pond ecology. The garden was designed by Lang and Wood, landscape architects, and was made possible by donations to the California Arboretum Foundation, Inc., principally by Mrs. Manfred Meyberg who supplied the major funds for the waterfall.

Construction of paths along the hillside, installation of an automatic sprinkler system, and all of the landscaping was accomplished by the gardening staff.

JUNIPER COLLECTION

As a result of additions planted in March, 1971, this collection now contains most of the junipers available in the nursery trade in Los Angeles County. The present total is 132 plants of 78 cultivars representing 10 species. The collection is the only extensive display of junipers in Southern California.

DISPLAY GREENHOUSES

Two greenhouses, valued at $5,655, were donated through the California Arboretum Foundation. One, 14′ X 12′, was placed under the shade of two oaks adjoining the juniper collection. Completed June 15, 1971, it houses a unique collection of bromeliads.

The other, 30′ X 32′, was installed in the nursery area June 1, 1971. It will house a $1,500 fern collection.

WEATHER

The Plant Records Unit serves as an official United States Cooperative Weather Bureau, recording data for the benefit of the Fruit Frost Warning Service of San Gabriel Valley and for Arboretum horticulturists.

Data for the weather season, Oct. 1 to Sept. 30:

	1969-70	1970-71
Lowest temperature	26° - Dec. 30, 1969	25° - Jan. 2-3, 1970 and Dec. 14, 1971
Highest temperature	106° - July 4, 1970	110° - Sept. 12-13, 1971
Total days of rainfall	24 days	29 days
Heaviest monthly rainfall	March - 6.27 in.	December - 6.53 in.
Yearly rainfall	13.99	15.41

Whereas the significant weather story of the previous Biennial Report had to do with periods of destructive rainfall, this report deals with another element of destruction — wind. The Arboretum, along with the rest of Southern California, experienced violent Santa Ana winds on several occasions. On December 26, 1969, a wind of gale dimensions (70 mph) blew over the Arboretum's famous 200-year-old "Tarzan" oak, and whipped a normally easily-controlled fire into a conflagration that destroyed or charred numerous trees, mostly palms. During December 7 and 8, 1971, gale winds knocked down trees and the weather station. On February 9, 1971, the Arboretum survived with relatively little damage an earthquake that registered 6.5 on the Richter scale. An earthquake that occurred on September 12, 1970, measured 5.5 on the Richter scale and caused no damage.

PLANT INTRODUCTIONS — *Vital to Southern California*

If it were not for the introduction of plants from other parts of the world — and adequate irrigation to sustain them — most of Southern California's urban landscape would be drab and barren. Probably 99% of the flowering trees and shrubs used in the Los Angeles landscape are introduced from other parts of the world. As a consequence, the Department's plant introduction and plant collection programs are given top priority among its many programs.

So far, the Department has introduced 58 exotic plants (November 1957 - August 1971) to the Southern California nursery trade. Listed below are another 16 plants currently being developed and tested for their potential introduction to the area.

In selecting these and other potential plant introductions, esthetic values are by no means the only consideration. Relative resistance to smog, insects, and disease are equally important factors requiring laboratory and field analysis on the one hand, and on the other, the development of new varieties through genetic selection and through cloning and other horticultural practices.

Mass plantings, especially along roadways, of selected items of horticultural value will be carried out extensively at the Arboretum, Descanso Gardens, and South Coast Botanic Garden.

Potential plant introductions:

Aesculus indica
Agapanthus hybrid 'Mood Indigo'
Brachysema lanceolatum
Bucklandia populnea
Callistemon pachyphllus viridis

Camellias:
'LASCA Beauty'
'Dr. Clifford Parks'

Chorisia speciosa (clonal selection)
Dodonaea microzyga
E. pauciflora
Hymenosporum flavum (clonal selection)
Kunzea sericea
Leptospermum scoparium 'Boscawenii'
Markhamia lutea
Stigmaphyllon affine
Viburnum rigidum

PLANT RECORDS — *Clearing house for Arboretum plants and seed.*

At the time of this report, there are 7,420 accessions, representing 168 families, 1,062 genera, 3,537 species, and 1,677 varieties of plants in the field.

Looking into the future, changes can be expected not so much in figures but in the character of the plants they represent. An active seed exchange program with foreign botanic gardens, genetic research, and the Department's plant introduction program will combine to replace some species and many more varieties.

In this biennium, data cards covering field collections at the Arboretum were microfilmed and sent to the plant Records Center of the American Horticultural Society in Lima, Pennsylvania, there to be filed along with the data cards of most of the botanic gardens in the United States, thus contributing to an invaluable pool of information readily available to interested persons all over the world.

DESCANSO GARDENS, *La Canada*

ATTENDANCE

1967 - 68	1968 - 69	1969 - 70	1970 - 71
500,104	391,119	504,224	447,417
891,223		951,641	

NEW GARDENS

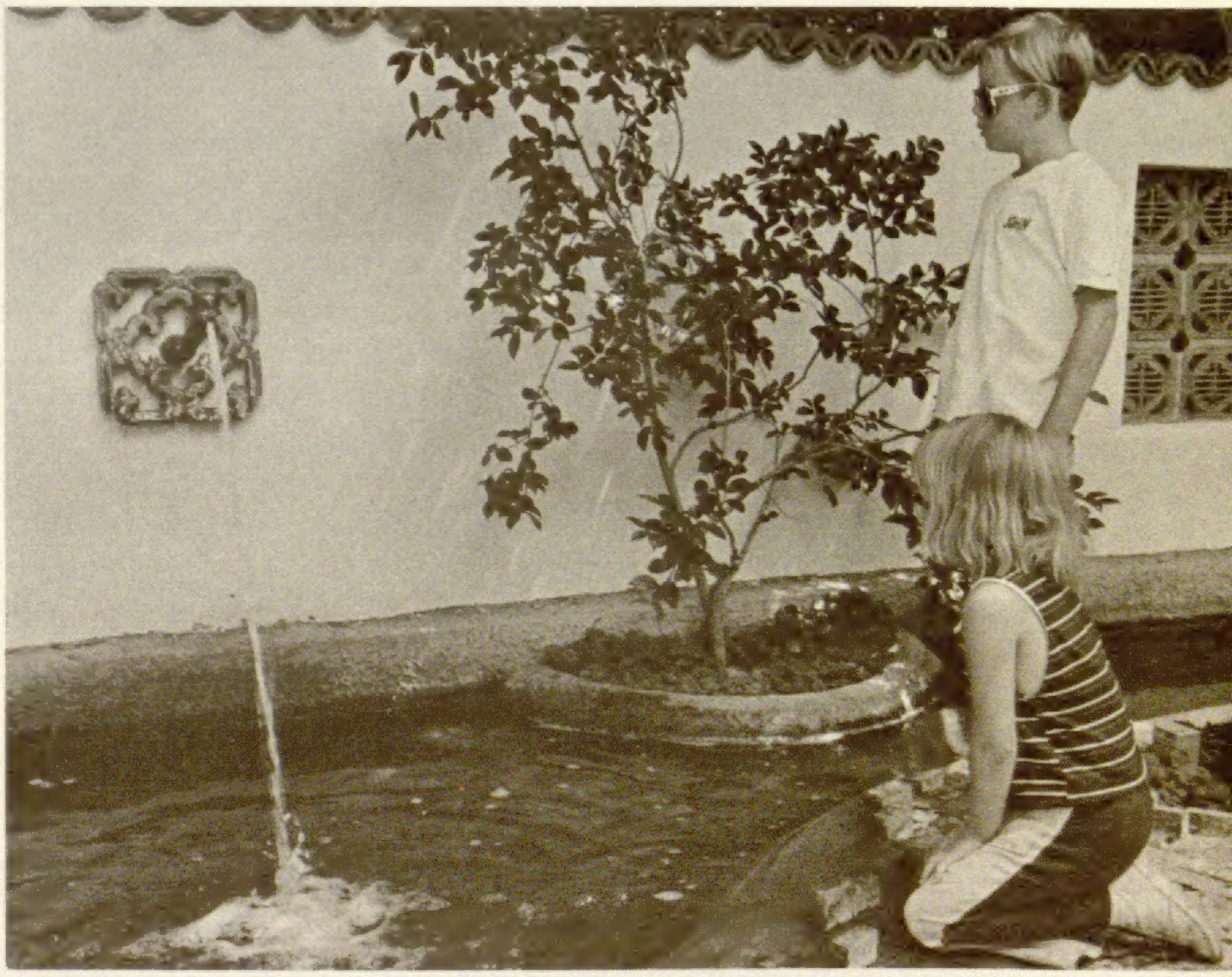
Four new gardens were developed in this biennium:

the Chinese Garden north of the Hospitality House, built through a donation of $10,000 by the John J. Howard family which also donated ancient, ornamental tiles;

an Azalea Garden donated by the Fay F. Wilcox family;

a garden of 60 South African and Australian proteas, donated and planted by Dr. Cecil Eschelman;

a third Children's Garden. Two, already in operation, are for handicapped children; the third was provided for children with special problems of La Crescenta schools.



A corner of the Chinese Garden

DONATIONS

A special planting of old-fashioned roses was donated by the Descanso Gardens Guild in honor of Mrs. Judge Smith upon her retirement as Chairman of the Board.

Two new gas stoves for use in the Hospitality House were donated by Mrs. Paul McClellan of the Los Angeles Camellia Council.

Two recirculating fountain pumps and 120 rose bushes were donated by the Los Angeles Camellia Council.

SOUTH COAST BOTANIC GARDEN, *Palos Verdes Peninsula*

ATTENDANCE

The dramatic rise in attendance at South Coast Botanic Garden can be attributed to the overall development of the gardens in terms of plantings and attractions, an increase in public services including tram tours, and a progressive increase in public hours.

At the beginning of this biennium the garden was open to the public four days a week from 10 a.m. to 4 p.m. From November 27, 1970, it was opened to the public six days a week, the hours remaining the same, and on April 26, 1971, its hours became the same as the Arboretum and Descanso Gardens — seven days a week, 8 to 5:30 p.m.

1967 - 68	1968 - 69	1969 - 70	1970 - 71
19,334	21,571	33,277	47,111
40,905		80,388	

WEATHER

South Coast Botanic Garden weather charts are made available to the Los Angeles County Flood Control District Hydraulic Division and the garden issues a monthly chart for Palos Verdes Peninsula.

Data for the weather season, Oct. 1 to Sept. 30:

	1969-70	1970-71
Lowest temperature	29° — Jan. 1 and 2, 1970	24° - Jan. 2, 1971
Highest temperature	101° — Sept. 27, 1970	105° — Sept. 13, 1971
Total days of rainfall	26 days	31 days
Heaviest monthly rainfall	Feb. - 2.78	Nov. - 6.61
Yearly rainfall	8.37	13.81

The earthquake on February 9, 1971, caused minor cracks in the road above the lake, and aftershocks and settling of soil was partially responsible for a 90-foot crack 3-inches wide near the north shore necessitating draining the lake in July.

LAKE AND STREAM

The membrane serving as the base for the man-made lake and stream was laid and tarred and the job completed December 2, 1969. The lake was filled on December 8th and the circulating system was put in operation, returning the water that spills from the lake and cascades down through the stream bed. A 27-foot oval island with small trees and plants was constructed in the following three months. 28 boxes and plastic tubs planted with water lilies and other aquatic plants enhanced the east shore; other plantings coming down to the waters edge on the southwest bank improved that area.

It was quickly demonstrated that the lake and stream had more than ornamental value. There was an immediate increase in the number of wild bird species. The State Department of Fish and Game utilized the lake for an experiment designed to save an endangered species of fish — the Mojave Chub. On January 26, 1970, 146 chubs were deposited in the lake, some later getting down into the stream. The island helped to save the fish from natural predators for it had 400 3-inch diameter pipes used in the basal construction which allowed the fish to spawn safely. Bureau of Fisheries estimated that they took more than 6,000 fish back to Chino. Some of these fish will be reintroduced into pools in the desert.

View of the 1,000-foot recirculating stream running from the small lake at South Coast Botanic Garden.

GROUNDS MAINTENANCE

The continuing decomposition of trash in the subsurface of the garden causes greater heat in more areas. Readings of 115° to 135° are common; one spot checked by sanitation engineers had a high of 161° on the east slope. Despite the resultant horticultural problems and occasional broken pipes resulting from continued settling of the ground, plant collections have improved in quality

PLANT INTRODUCTION

In September of 1970 the garden introduced a dwarf myoporum — *Myoporum lactum* 'Compacta',*Grevillea menatophylla* 'Silver Explosion' is expected to be introduced in 1972.

EDUCATION — *Classes, workshops, field studies the year round for students of all ages.*

The Department utilizes its plant collections, nurseries, youth centers, the flora and fauna of its natural settings, and the talents of its staff specialists to offer a broad educational program uniquely suited to its resources and responsive to the needs of the community and schools.

YOUTH WORKSHOPS

At all facilities in this biennial period 139 workshops were conducted for 1677 students of grades 1 through 9 (ages 6 - 14 yrs.) in the following subjects:

Art in Nature
Container Gardening
Exploring Nature
Flower Gardening
Gardening
Gardening Skills
Greenhouse Propagation
Hobby Gardens
Indoor Gardens
Natural Dye Craft
Nature Craft
Plant Adventures
Plant Propagation
Pond Life
Pot Gardening
Pre-Vocational Gardening
Vegetable Gardening

SCHOOL FIELD TRIPS

School field trips are a regular school curriculum supplement. The content of field trips to the Department's three facilities and the teaching methods used result from meetings of staff members with school curriculum specialists and district officials.

65,000 students and 2200 teachers were given 2500 field trips in this biennial period in these subjects:

Nature and Conservation
Early California History
Plant Science
Arboretum Overview

This impressive number of students and teachers came from the 75 school districts served by the Department covering 130 cities. Nearly 70% of these field trips were led by volunteers trained by the Department staff who led the balance of the field trips.

Led by staff tour guide, group of fourth graders on school field trip to Arboretum get acquanted with some of the plants and animals in the aquatic garden atop Tallac Knoll.

ADULT CLASSES

The Department offers day and evening classes for adults during the spring and fall primarily designed to serve the horticultural interests of the home gardener. Additionally, there are classes in botanical art and California history, classes dealing with environmental problems, and a few advanced classes for professionals in the field of horticulture. The classes are sponsored variously by Pasadena City College, Los Angeles Harbor College, U.C.L.A., and the Department's affiliated foundations.

In this biennial period a total of 90 classes were conducted at the Department's facilities for 1,677 registered students in the following subjects:

Advanced Bonsai
Beginning Bonsai
Bonsai
California Heritage
California History
Christmas Decorating
Container Gardening
Contemporary Flower Arrangement
Diseases of Ornamental Plants
Flower Arrangement
Gardening Clinic
Holiday Decorations
Home Gardening A
Home Gardening B
Home Gardening
Home Horticulture
Home Landscape Design
Horticultural Botany
How To Grow Bromeliads
Lawn Care
Orchid Culture
Ornamental Trees
Plant Breeding
Plant Identification
Plant Propagation
Plants in the Ecology of Man
Poisonous and Medicinal Plants
Residential Area Pests
Shade Gardening
Sketching and Water Colors
Soils and Plant Nutrition
Taxonomy of Flowering Plants
Turfgrass Management

All youth education programs conducted within the Department are free, except for some of the summer workshops which charge nominal lab and course fees. Similarly, adult classes are free except where lab fees are required and except for a number of special classes sponsored by affiliated foundations requiring a course fee.

ARBORETUM HISTORICAL SECTION

The dedication on September 25,1970, of the restored Santa Anita Depot added a fourth house-museum to the historical complex at the Arboretum. The depot was subsequently designated a Historical Point of Interest by the State of California.

Saving the depot from destruction, moving it from its original location on Colorado Boulevard, and rebuilding it on the grounds of the Arboretum was the result of dedicated work by diverse groups, among them the Save-the-Depot committee, the Arcadia Historical Society, the Arcadia Chamber of Commerce and the California Arboretum Foundation who collectively raised $30,000 and initiated gifts of construction materials, labor, and furnishings. The Los Angeles County Board of Supervisors voted $8,000 toward completion of the depot which was opened to the public in March, 1971, on a limited schedule.

The boathouse adjoining the Queen Anne Cottage and the corrals, wickiups, and ramadas adjoining the Hugo Reid Adobe were lost in a windblown fire that swept through the Arboretum on December 26, 1969. All have since been restored and burned areas relandscaped.

Donations of artifacts during the period are notable. 1,049 items, the gifts of 15 donors, were catalogued. The Historical Section, in turn, has made donations of duplicate or chronologically unsuitable items to other historical museums and societies. Resource collections now number 1900 slides, 600 pictures, and 142 bibliographies.

Public services include daily field trips for school children, interpretive displays in the coach barn and the Arboretum rotunda, Boy Scout counseling on basketry and Indian Lore, and directing a group of 17 young historians.

PUBLIC SERVICES — *Exemplify the character of contemporary botanic gardens.*

TRAM TOURS

Tram tours are in great demand at each of the Department's facilities. They provide the visitor with an introduction to the plant collections, a history of the garden, and a preview of the various attractions.

The data below shows the number of visitors served in this biennium out of a total attendance of 2,158,000.

	ABORETUM	DESCANSO	SOUTH COAST
Number of tours	9,100	6,344	230 (6 months)
Number of visitors served by trams	364,000	285,480	4,404

PUBLICATIONS

Three booklets bearing on environmental problems were produced in the 1969-71 biennium: Fire Retardant Plants, Insecticides Around the Home, and Beneficial Insects. Following the devastating brushfires that burned out many hillside areas in Southern California in the last week of September, 1970, over 20,000 Fire Retardant Plant booklets were distributed by the Department and by the County Departments of Flood Control and Forester and Fire Warden. As a further service at this time, and in response to numerous telephone calls from homeowners asking for information about watering burned areas, radio and television stations were supplied with a brief statement of directions.

The Department also produces each year a variety of calendars, class schedules, field trip brochures for visiting teachers, and information pamphlets.

LECTURES

Early in 1971 a new series of "Sunday Afternoon Lectures at 2" was started at the Arboretum planned for the home gardener and those interested in the environmental factors surrounding the growing of plants. Initial response was so favorable that similar lectures have been planned for coming seasons. Repeated in this biennium was the annual series of six free lectures presented by the Theodore Payne Foundation For the Preservation of Wildflowers and Native Plants in cooperation with the Department. These were held alternately at the Arboretum and at Descanso Gardens.

HORTICULTURAL SERVICE

The log of the Botanical Information Consultant showed 6,485 conferences conducted by telephone, mail, or in person in this biennium. The category receiving the greatest number of inquiries was the care and planting of lawns, followed by pruning, weed and pest control, and commercial sources of plants. This does not include the equally great number of inquiries answered by other members of the professional staff.

PLANT SCIENCE LIBRARY

The Plant Science Reference Library at the Arboretum contains approximately 17,000 catalogued books and pamphlets and subscribes to 500 periodicals.

In this biennial period the library has acquired a 350-volume collection of the California State Garden Clubs, has on loan from the Herb Society its collection of approximately 200 volumes, and has received as gifts 13 volumes of Orchis, 5 volumes of Hortus Kewensis, and a collection of books on trees.

The library is open to the public 9-5, Monday through Friday. In the last quarter 14 volunteers contributed 283 hours to library work.

ARBOR DAY EVENTS

Tree planting programs at each of the three botanic gardens honor Conservation Week by giving seedling trees with planting instructions to the 3,700 or more children present each year.

Seedlings of *Pinus halapensis, Eucalyptus erythrocorys* and *Acacia baileyana* were provided by the Angeles National Forest, the Arcadia Jr. Woman's Club, and by the Department. Members of the Los Angeles County Board of Supervisors, the Los Angeles Beautiful organizations and the Foundations participated in the program.

The various gardens within the Department serve as a central meeting place for societies, garden clubs, and civic organizations.

Agricultural Commission
Akebono Bonsai Society
Altadena Hilltoppers Garden Club
American Begonia Society Board Meeting
American Begonia Society, San Gabriel Valley Branch
American Patent Law Association
Arcadia Chamber of Commerce
Arcadia Garden Club
Arcadia Rotary
Arcadia-Sierra Madre Newcomers
Aril Society
Baikoen Bonsai Kenkyukai Society
Board of Governors
Cactus and Succulent Society of America
California Association of Nurserymen
California Garden Club, Arboretum District
Chapter F.O.-P.E.O.
College Alumni Auxiliary Over 50 Club
Costa Verde District Garden Clubs
Cymbidium Society of America
Daughters of the American Revolution
Delta Cappa Gamma
Descanso Guild
El Monte Gardeneers
Entomology Club of Southern California
Floralia Guild
Garden Section of College Womens Club of Pasadena
Hastings Ranch Garden Club
Herb Society of America
Hermosa Garden Club
Hilltoppers Garden Club
Inglewood Dahlia Society
La Canada Valley Garden Club
Las Jardineras Garden Club
Las Voluntarias
Mens Garden Club of Los Angeles
Nichi Bii Fuyin Kai
Pacific Rose Society
Palm Society
Pasadena Art Council
Pasadena Garden Club
Riviera/Los Colinas Garden Clubs
San Gabriel Valley Cactus & Succulent Society
San Gabriel Valley Orchid Hobbyist
Santa Anita Bonsai Society
South Bay Bromeliad Society
Southern California Gladiolous Society
Southern California Hemerocallis & Amaryllis Society
Southern California Iris Society
Southland Orchid Board
Temple City Camellia Society
Theodore Payne Foundation
Town & Country Garden Club
United Crusade
Western Orchid Conference
Wilmington Women's Club
Women's Auxiliary of Los Angeles County Medical

Flower Shows and Special Events Held at the Department's Gardens:

LOS ANGELES STATE AND COUNTY ARBORETUM

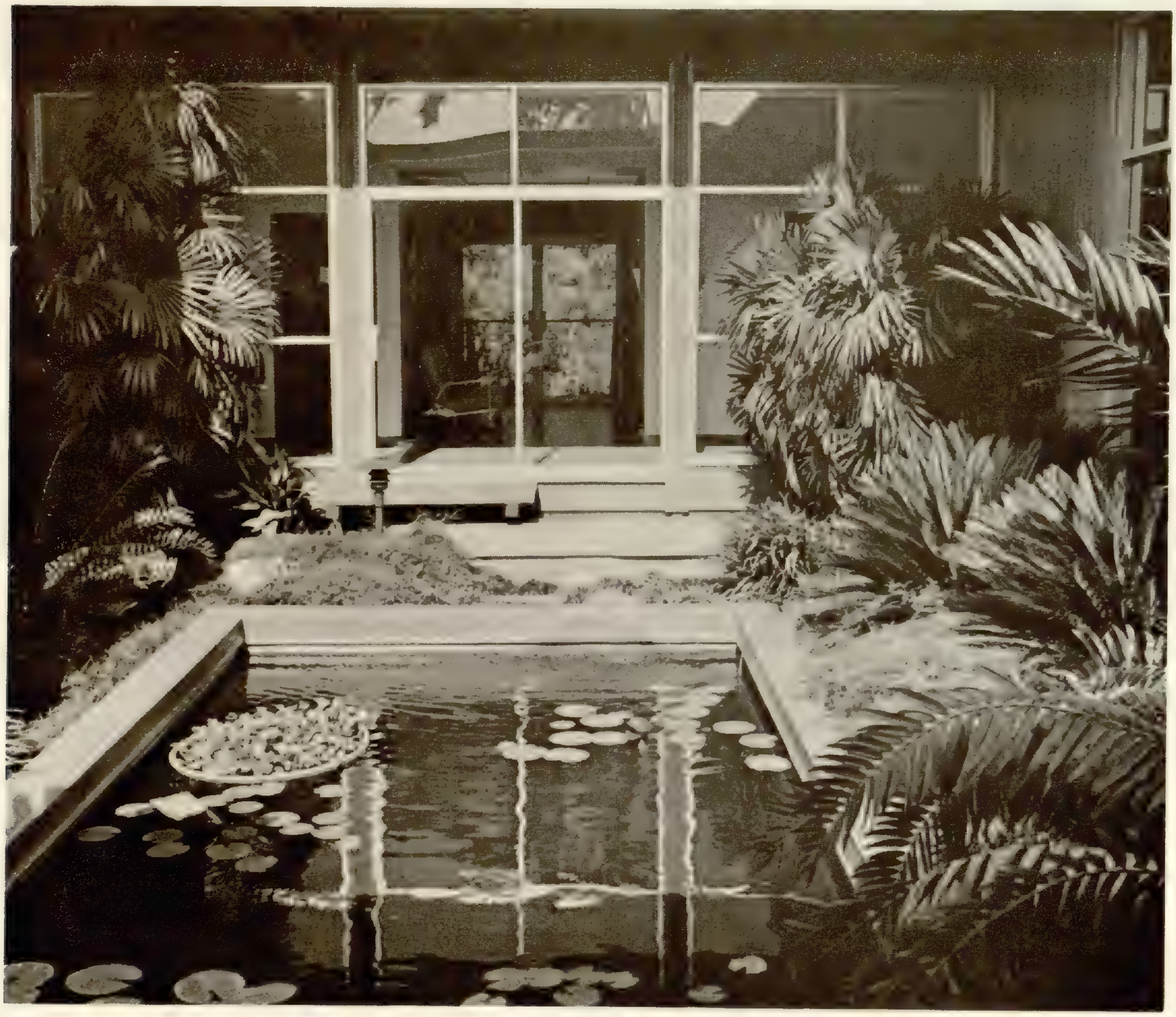
Temple City Camellia Society Show (2)
Southland Orchid Show
Aril Iris Show (2)
Amaryllis Show (2)
Baldwin Bonanza Treasure Sale
Geranium Show
Epiphyllum Show (2)
Santa Anita Bonsai (2)
Bromeliad Show (2)
Cactus and Succulent Show
San Gabriel Valley Begonia Show
Akebono Bonsai Show
Fall Flower Show
Southern California Iris Show
Baikoen Bonsai Kenkyukai Show
Arbor Day Celebration
Theodore Payne Foundation Lectures (6)
Department Lecture — Demonstrations (3)

DESCANSO GARDENS

Los Angeles Camellia Council Show
Daffodil Show (3)
Exhibit of Botanical Paintings — Miss Ethelynde Smith
Art Exhibit — The Newcomers Art Club
Art Exhibit — Ruby Anderson
Musical Entertainment
Annual Bonsai Show
Chrysanthemum Show
Descanso Guild Christmas Decorations Show
Rose Pruning Demonstration
Mid-Valley Artist League Show
Camellia Show
Eagle Rock Artist Association Exhibit
Arbor Day Celebration
Art Festival on the Lawn
Theodore Payne Foundation Lectures (6)

SOUTH COAST BOTANIC GARDEN

Los Angeles Bay Harbor District of Garden Clubs
Silver Spur Garden Club (2)
Las Colinas Garden Club (2)
Rivera Garden Club Show
Fiesta de Flores (2)



View of the atrium in the new, 8,100-square-foot research building at the Arboretum.

AIR POLLUTION

A cause and effect relationship exists between plants and air pollution. Smog damages some plants, some plants are resistant to smog, some have the capacity to absorb significant quantities of certain air pollutants.

Continuing studies have shown that the various components of air pollution such as ozone and peroxy acetyl nitrate (PAN) interfere with starch hydrolysis in leaves preventing normal translocation of foods in the plant.

Selected varieties of petunias which differ in their sensitivity to smog have been analyzed to ascertain the mechanisms of plant tolerance to air pollutants. Vitamin C was found to be higher in petunias tolerant to smog than in those which are easily damaged by air pollutants. Other studies have shown that plants are capable of absorbing significant quantities of air pollutants and thus when utilized in proper planting arrangements may serve to protect selected areas from high pollution levels. The results from these preliminary investigations were incorporated into a grant proposal for further studies and an award of $21,080 was received from the Environmental Protection Agency to continue the work.

FIRE, PLANTS, AND ECOLOGY

Given the yearly losses in life and property resulting from brush fires in Southern California's chaparral-covered hillsides, a major program is directed toward investigations into the nature of plant flammability and fire retardance, the capacity of fire retardant species to become naturalized in our local mountain areas, and a view of fire from an ecological standpoint. Additionally, a continuing public information and education program centered in a 12-page brochure listing plants for "green belt" landscaping (prepared in collaboration with the Los Angeles County Forester and Fire Warden, Forestry Division) and the servicing of radio, television, and the press with watering and other horticultural guidelines following a fire, have helped the public, and particularly those affected, understand the true nature of brush fires and the value and limits of preventive measures.

PATHOLOGY

An estimated 700 species of ornamental plants in Southern California are infected by oak root rot fungus (*Armillaria mellea*). Although eradication of this disease has yet to be achieved, progress is being made in controlling it. In the past year, field and greenhouse tests have shown that the systemic fungicide Actidione curbs the progress of infection when applied at an early stage.

In addition to long-range studies of certain plant diseases, the Department provides a disease-identifying service for the public coupled with directions for treatment. Some common examples are the virus diseases of orchids, the powdery mildew of roses, sycamore blight, the flower blight or fungus that attacks camellias in California, and diseases due not to organisms but to nutritional disorders and unfavorable environmental conditions.

ENTOMOLOGY

A survey of the host plant relationships of aphids and whiteflies at the Los Angeles State and County Arboretum was concluded in this biennial period. About 100 species of aphids have been found, three not previously described. Aphids were collected from about 3,000 species of plants; an additional 1,000 species proved to be free from aphid infestation during the period of this survey. Some species of aphids have been restricted to only a few closely related species of plants while others are much more widely distributed. For example, *Myzus persicae* has been identified on well over 500 species of plants.

CAMELLIAS

The camellia research program has concentrated on the selection of desirable types from existing hybrids, production of new interspecific hybrids, and studies of pollen storage. A number of potential introductions have now been set aside for further study. One of these hybrids, a cross between *C. reticulata* and *C. japonica,* won the best hybrid seedling award at the 1971 Los Angeles Camellia Council show at Descanso Gardens. Plans are underway to introduce this seedling, named in honor of Cliff Parks, a former Arboretum camellia researcher, in the near future. Another seedling, named John Anson Ford after the former member of the Los Angeles County Board of Supervisors, will be introduced as soon as sufficient material is available.

New crosses are made each season to develop new hybrids. The emphasis is to develop a new habit of foliage type, increase fragrance, improve sun tolerance, and extend the flowering season of some species. Pollen storage studies have begun with the goal to work out methods of storing camellia pollen to make feasible crosses between species that do not overlap in flowering time and to facilitate the use of lesser known species by amateurs.

The hibiscus breeding program is now emphasizing frost tolerance due to severe damage in past seasons. Numerous attractive flowers have been developed but have not been released due to poor performance in the field and to frost sensitivity. Another project is the development via gamma rays of hibiscus cultivars which can be grown in hanging baskets. Some progress toward the development of a cascading *H. schizopetalus* has been made.

HERBARIUM — *A repository of plant information, a research tool for taxonomists and students.*

Some 10,000 dried plant specimens are mounted and filed in the Department's herbarium at the Los Angeles State and County Arboretum and twice this number are in the process of being identified, classified, mounted, and labeled in order to make the material readily useful to plant scientists.

An herbarium is very much like a library — there is a constant influx and outgo of material: some of it new, coming in from the field or from donors; some being returned by borrowers; some of it going out on loan or on exchange. Most of the Arboretum herbarium specimens were collected by Arboretum botanists and their associates, but many were obtained through exchanges with other botanic gardens in the United States and other parts of the world.

During the past two years the collection has been utilized by taxonomists writing monographs on *Acacia* and *Erythrina* and doing research on *Eucalyptus, Myoporum,* and the cultivated trees of Southern California.

PUBLIC INQUIRIES

As in every biennial period, each section of the research division answered a large number of questions from the public including the identification of diseases and insects. Displays were prepared on air pollution, fungi, poisonous plants, and other subjects of concern to the public and to students.

STAFF PUBLICATIONS

P. C. CHEO

Rose wilt or dieback — a new virus disease attacks roses in California. Lasca Leaves XX (4); 88-89, 1970

Effect of plant hormones on virus replicating capacity on cotton infected with tobacco mosaic virus. Phytopathology 61:869-872, 1971

Effect in different plant species of continuous light and dark treatment in TMV replicating capacity. Virology, 1971

With John S. Gerard. Difference in virus - replicating capacity among plant species inoculated with tobacco mosaic virus. Phytopathology, 61:1010-1012, 1971

With Kenneth R. Montgomery. The Study of Fire Retardance in Plants. 1970, Lasca Leaves XX (3): 52-56

With Kenneth R. Montgomery. Fire Retardant Plants for Brush Fire Prevention in Hillside Residential Areas. Lasca Leaves XX (3): 56-58, 67.

R. L. GONDERMAN

Better Trees through New Propagation Methods. Landscape Industry, May - June 1970, Vol. 15, 4, 26a

With D. L. Martin. The effects of DMSO and IBA on Propagation of Selected Trees Difficult to Root by Cuttings. 1970, the Plant Propagator, Vol. 16, 3, 5-7, S pt 1970

Rooting of Eucalyptus ficifolia from cuttings. 1971 California Horticultural Journal, Vol. 32 1, 27-30

GEORGE P. HANSON

Camellia Research at the Los Angeles County Arboretum. 1970, The Camellia Review 31 (4): 12-16

With Robert L. Gonderman and Carlos Jativa. Camellia Rooting Studies at the Los Angeles State and County Arboretum. 1970, The Camellia Review 32 (2): 14-17

With William S. Stewart. Photochemical Oxidants: Effect on Starch Hydrolysis in Leaves. 1970, Science 168 (3936): 1223-1224

With Linda Thorne and Carlos D. Jativa. Vitamin C — A natural smog resistance mechanism in plants? Lasca Leaves XX (1): 6-7, 1970

Man and Air — Threats to Prairie Survival. Lasca Leaves XX (4): 78-81 (92) 1970

With Linda Thorne. A Partial Pollution Solution: Plant Trees! Lasca Leaves XX 35-36, 1970

With Linda Thorne and Carlos D. Jativa. Ozone Tolerance of Petunia Leaves as Related to Their Ascorbic Acid Concentration. 1971, Proceedings of the Second International Clean Air Congress, Academic Press, N. Y. 261-266

KENNETH R. MONTGOMERY

With P. C. Cheo. The Effect of Leaf Thickness on Ignitability. 1971, Forest Science, Vol. 17, 475-478.

With Russ Stalllings, Forestry Division. Fire Retardant Plants for Hillside Areas. Departmental Brochure, County of Los Angeles. 12 pg.

HARRY G. WALKER

With M. D. Leonard and Leonid Enari. Aphid Investigations at the Los Angeles State and County Arboretum. June 1969 Lasca Leaves, Vol. XIX, No. 2

With M. D. Leonard and L. Enari. Host Plants of Myzus persicae Sulzer at the Los Angeles State and County Arboretum, Arcadia, California (Homoptera Aphididae) Sept. 1970 Vol. 73, No. 3, 294-312. Proceedings of Entomological Society of Washington.

With M. D. Leonard and L. Enari. Host plants of Aphis gossypii Glover (Homotera Aphididae) at the Los Angeles State and County Arboretum, Arcadia, California. March, 1971 Vol. 73, No. 1, 9-16. Proceedings of Entomological Society of Washington.

With M. D. Leonard and L. Enari. Host plants of Toxoptera aurantii (Fonscolombe), (Homoptera Aphididae) at the Los Angeles State and County Arboretum, Arcadia, California. Vol. 73, No. 3, 324-326. Proceedings of Entomological Society of Washington.

With M. D. Leonard and L. Enari. Host plants of three polyphagous and widely distributed aphids (Homoptera: Aphididae) at the Los Angeles State and County Arboretum, Arcadia, California. June, 1971, Vol. 73, No. 2, 120-131. Proceedings of Entomological Society of Washington.

Beneficial Insects - Department brochure.

SUPPORTING FOUNDATIONS — *Cornerstones of public agencies.*

In this Department, as with many museums, hospitals, zoos, and other public agencies, nonprofit supporting foundations make possible the implementation of numerous projects and programs beyond the reach of government-allocated budgets. The very existence of the three gardens of this Department can be credited to the original members of the California Arboretum Foundation, the Descanso Gardens Guild, and the South Coast Botanic Garden Foundation, who had the interest, the will, and the political persuasiveness to make them a reality.

CALIFORNIA ARBORETUM FOUNDATION

Formed in 1948, the California Arboretum Foundation is the oldest of the Department-affiliated foundations. It is governed by a Board of Trustees consisting of twenty-five Foundation members elected for a three-year term.

In this biennium, the Foundation sponsored three spring and fall classes for adults, cosponsored 35 flower shows, initiated a number of special tram tours, developed sale items for the gift shop, and sponsored the fund-raising event, the "Baldwin Bonanza." Foundation members gave many hours of their time assisting in all of these activities. Approximately 70% of the 1,300 school field trips conducted at the Arboretum in this biennium were led by members of Las Voluntarias, the Foundation volunteer organization, who also gave 33 hours each year to a rigorous training program.

The Foundation serves as administrative agent for all funds received by the Arboretum outside the regular county budget. Through research grants, memberships, fund-raising events, donations, and tuition fees, the Foundation contributed $126,482 in this biennial period in furthering the development and activities of the Arboretum. The major categories of contributions are listed below.

1. Funds for perpetuation of the Arboretum historical section ..... $ 350.

2. Funds for trees and Arbor Day ceremonies ..... 636.

3. Funds received for Research Division ..... 668.

4. Funds received for plant exploration ..... 1,900.

5. Purchase of rare books for Arboretum Library ..... 1,097.

6. Matching funds with Sunset Magazine for plantings in Demonstration Home Gardens ..... 1,200.

7. Funds for Youth Education Division — pond ecology studies and instructions 7,565.

8. Construction of Santa Anita Depot — funds from Community Save-The-Depot Campaign, plus electrical work, furnishings and cesspool connection ..... 34,185.

9. Harry J. Bauer Memorial Fund ..... 571.

10. Purchase of trailers for tram, plus maintenance and equipment ..... 3,359.

11. Repair and installation of two donated glasshouses ..... 955.

12. Publisher of Department quarterly magazine, "Lasca Leaves," distributed to Foundation members and to domestic and foreign botanic gardens and educational institutions. ..... 13,320.

13. Arboretum kiosk and signs ..... 632.

14. Proceeds from fund-raising "Baldwin Bonanza" ..... 3,377.

15. Manfred Meyberg Waterfall construction ..... 15,300.

16. Funds for Arboretum projects ..... 15,991.

17. Funds from Foundation-sponsored tours ..... 429.

18. Grant Awards for research from:

a. National Institues of Health "Air Pollution Effects on Plant Tissue" ..... 3,343.

b. National Science Foundation "Subliminal Infection and Inactivation 'In Viro' of Tobacco with Mosaic Virus" ..... 21,504.

19. Administered reserve funds donated by members and friends, such as Santa Anita Depot, The Herb Society, Las Voluntarias. Co-published Flowering Booklets with Los Angeles Beautiful and Southern California Horticultural Institute.

DESCANSO GARDENS GUILD

The Descanso Gardens Guild, formed in 1957, is governed by a Board of Trustees made up of twenty-five Guild members holding office on a rotating basis.

Through its memberships, special events, sale of post cards and books, and through donations, the Guild contributed $71,000 over the past two years for capital improvements to the Gardens. Principal expenditures were for the Minka, a gift shop constructed in the style of a Japanese farm house; a Chinese garden constructed off the living room of the Hospitality House; refurnishing rooms in the Hospitality House; and additions to the landscaping around the Japanese Tea House including a fine carved stone lantern.

The Guild, through its members and docent program (see VOLUNTEERS), contributed thousands of hours of volunteer time to a variety of Guild-sponsored public events and educational services for youth. In addition to serving as hostesses and guides at the annual daffodil, bonsai, and chrysanthemum shows, Guild members organized and staffed the biennial Festival of Gardens, Lights and Fountains (8 weeks in the summer of 1969), and two spring art festivals in May of 1970 and 1971.

A particularly effective Guild program is the Handicapped Children's program on which the Guild spends approximately $1,500 each year. Children from schools in Pasadena, La Crescenta, and Glendale were bused to the Gardens for weekly gardening and nature experiences. The Guild also sponsors a horticultural scholarship which enables one or two handicapped boys at a time to learn gardening care and maintenance under the supervision of professional gardeners. This program has enabled 5 young men to graduate with a socially useful skill and greater self-confidence.

SOUTH COAST BOTANIC GARDEN FOUNDATION

The South Coast Botanic Garden Foundation, incorporated in 1961, has been an active force in the development of this unique, young garden.

In this biennium, the Foundation received a public address system from the Silver Spur Garden Club and a tractor-drawn tram from the Los Angeles Camellia Council. This long sought-after vehicle has contributed dramatically to the increase in attendance at the Garden. The Foundation donated this vehicle to the County after having it mechanically overhauled and after its members had sanded and painted it.

The major event at South Coast each year is the Fiesta de Flores, a three-day flower and garden show sponsored and presented by the Foundation, and one of a number of Foundation-sponsored events that attract visitors to the Garden. The Foundation co-sponsors adult education classes at the Garden and provides valuable assistance by handling such matters as the collection and disbursement of fees and the mailing of announcement brochures.

VOLUNTEERS — *Key contributors to Department programs*

Roughly 150 volunteers perform regular, scheduled services at the Department's three gardens and more than ten times that many on an intermittent basis. The services they perform cover a wide range of activity and contribute greatly to the Department's effectiveness.

Volunteer teachers assist in the Department's summer youth education classes. Group here examines garden of annuals at the Arboretum.

LOS ANGELES STATE AND COUNTY ARBORETUM

At the Arboretum the principal volunteer organization, Las Voluntarias, consists of approximately 85 active members who serve primarily as school field trip leaders (see EDUCATION) but also provide yeoman service in such diverse areas as the gatehouse information window, in the nurseries, and in the Foundation gift shop. The organization is active in devising and presenting fund-raising events, notably, in the period of this report, the "Baldwin Bonanza," a first-of-its-kind effort which netted over $3,000. Las Voluntarias are members of the California Arboretum Foundation.

Also serving on a scheduled basis are members of the Southern California Unit of the Herb Society of America who work weekly in the Arboretum's Herb Garden and who develop and maintain the adjoining Fragrance Garden. With the assistance of the Santa Anita Highlands Garden Club, they conduct tours through the Fragrance Garden for the blind.

DESCANSO GARDENS

Practically all volunteers at Descanso Gardens are members of the Descanso Gardens Guild. In addition to the services rendered by the general membership (see SUPPORTING FOUNDATIONS), docents, organized by the Guild, serve as school field trip leaders in the Department's youth education program.

SOUTH COAST BOTANIC GARDEN

As at Descanso Gardens, volunteers at South Coast are members of the SCBG Foundation. In this biennium, as in the past, Foundation volunteers contributed many hours of work to various garden projects — notably in the propagation section — and as school field trip leaders, as visitor hosts, and as general assistance aids during special events.

FINANCIAL REPORT
1969 - 71

DEPARTMENTAL SUMMARY

1969 - 70

	APPROPRIATION	EXPENDITURE	BALANCE
Salaries and Wages	1,200,932	1,196,473	4,459
Services and Supplies	137,722	165,055	(-27,333)
Capital Outlay Equipment	27,795	21,354	6,441
Total Department	1,366,449	1,382,882	(-16,433)
Number of Budgeted Positions	147.8		

1970 - 71

Salaries and Wages	1,325,638	1,267,974	57,664
Services and Supplies	152,858	139,178	13,680
Capital Outlay Equipment	19,085	11,944	7,141
Total Department	1,497,581	1,419,096	78,485
Number of Budgeted Positions	149.8		